



How to Backup Your PD² Database

June 7, 2001

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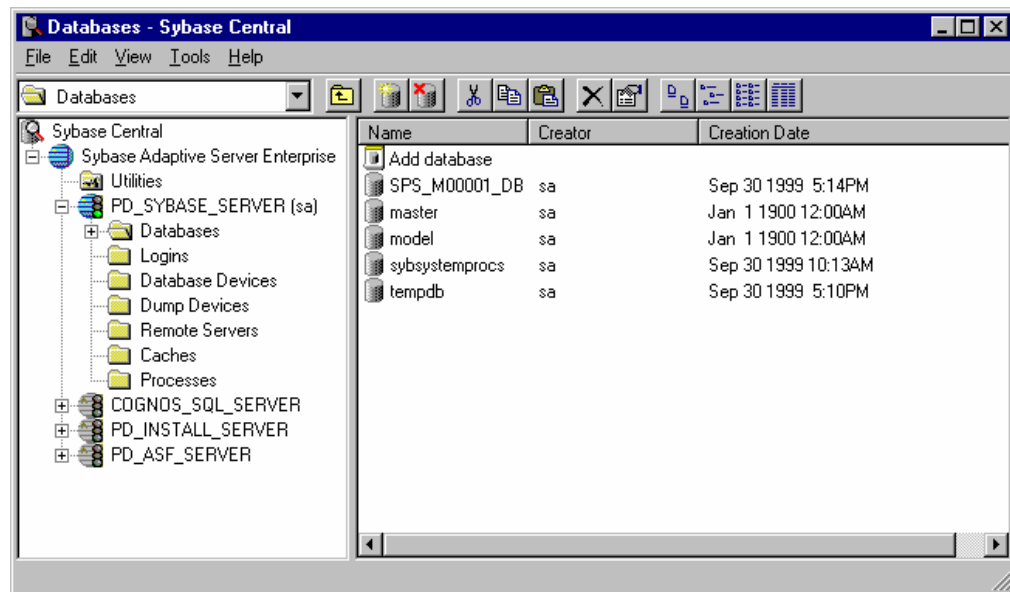
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1. Part I: Creating a Dump Device

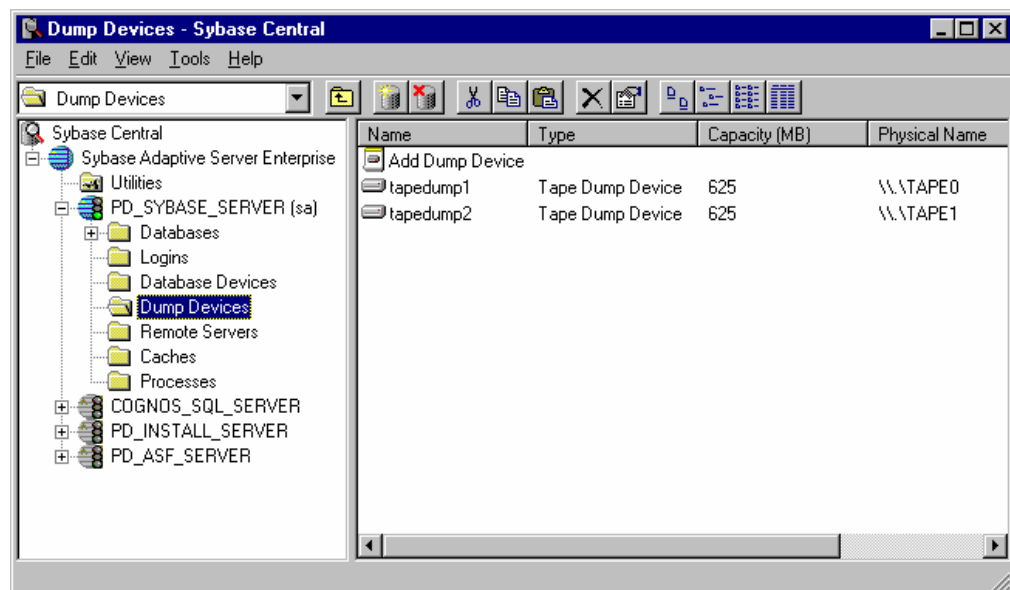
1.1 Using Sybase Central

Note: If you do not have access to Sybase Central you may follow the steps under Section 1.2 Using WISQL or SQL Advantage.

Open Sybase Central and connect to the server that houses the database that you wish to backup. You can log on to the server using your 'sa' id and password.



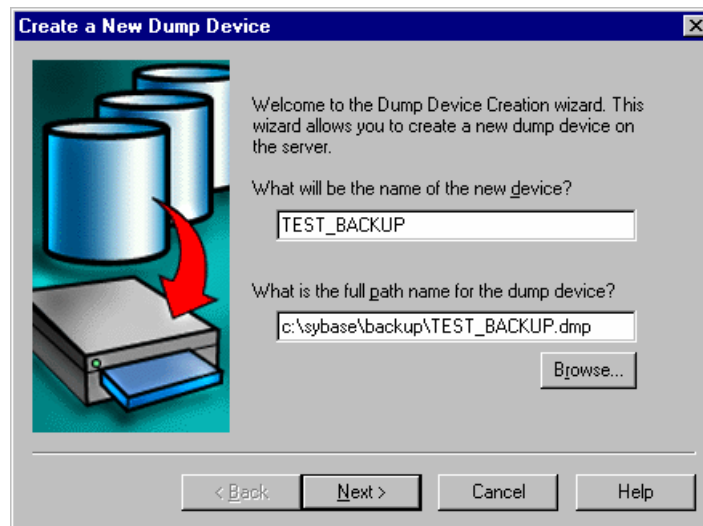
Open the folder entitled Dump Devices.



Double click on the 'Add Dump Device' icon. The 'Dump Device Creation' wizard appears. Type in the name of your new device and the full path of the device.

The "full path name" indicates the drive, directory and file name of where the new device will be located on the *server* not your client. Because of this you must include the .dmp extension. If you have a Unix server be sure to use the appropriate naming convention.

Note: Try not to place your dump devices on the same drive as your database devices. This will protect your dump devices from potential damaged in case the drive that contains your database devices fails.

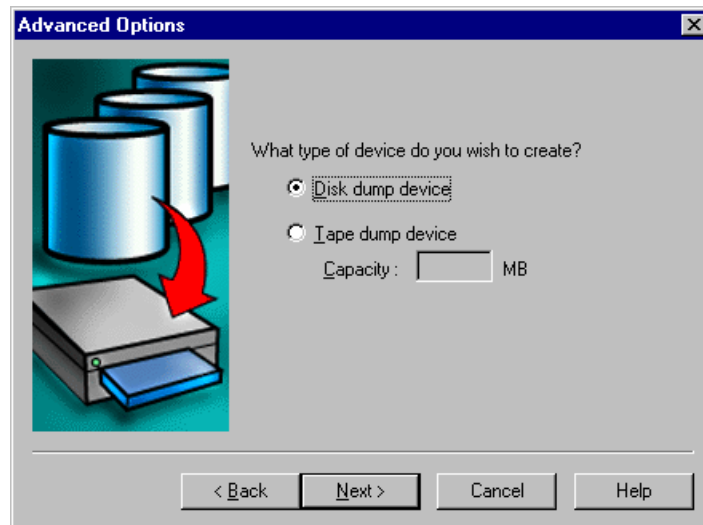


Note: Avoid using the "Browse..." button to specify the location of the dump device. The drives that appear when the "Browse..." button is selected are the ones that are mapped to the PC that you are using (not the server). For instance, the G: drive that is mapped to your client PC may not be the same G: drive that is mapped to the server.

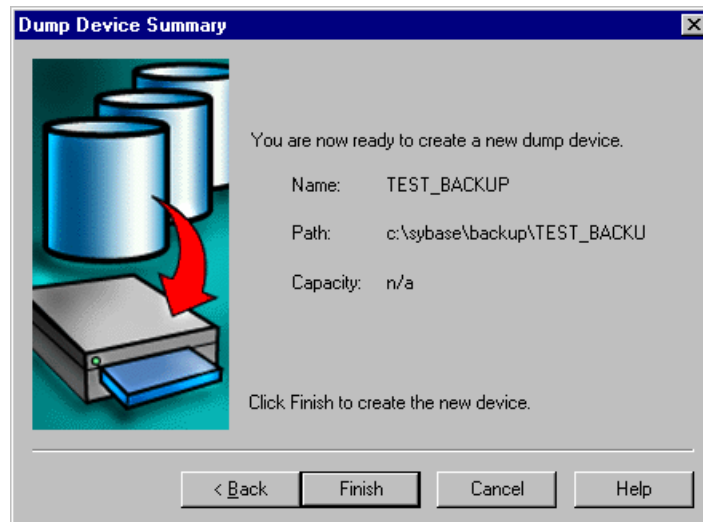
Click the 'Next' button.

Choose which type of device you want to create. A Disk dump device allows the user to backup data to a drive on the server. A Tape dump device allows the user to backup data to an external tape drive connected to the server. Click the 'Next' button.

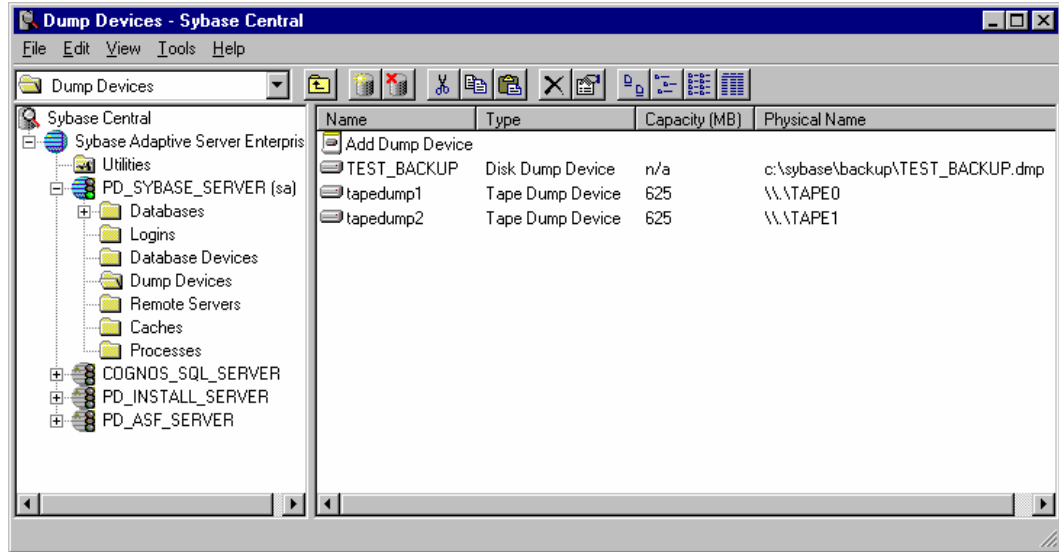
Note: When creating a Tape Dump Device you need to specify capacity of the tape. The device cannot exceed the capacity of the tape.



The final window is the "Dump Device Summary" window. This window displays the name of the device you want to create and where you want to create it. To display the rest of the Path information place your cursor this field and use the right arrow to scroll to the right. If everything is correct, click the 'Finish' button.



Your new device will appear in the 'Dump Devices' folder.



1.2 Using WISQL or SQL Advantage

Note: If you do not have access to WISQL or SQL Advantage you may follow the steps under Section 1.1 Using Sybase Central.

Execute the following command in WISQL or SQL Advantage to create a Dump Device.

```
sp_addumpdevice {"tape"|"disk"}, <logicalname>,
"<physicalname>", <tapesize>
```

<logicalname> = the name of the new dump device.

<physicalname> = the path and file name of the new dump device.

<tapesize> = the capacity of your tape drive in Megabytes. This parameter is not used when creating a disk device.

Example

```
sp_addumpdevice "disk", TEST_BACKUP,
"c:\sybase\backup\TEST_BACKUP.dmp"
go
```

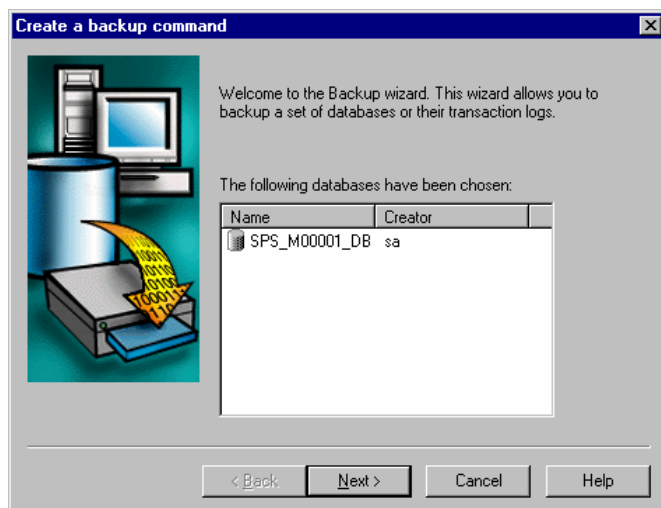
2. Part II: Backing Up the Database

2.1 Using Sybase Central

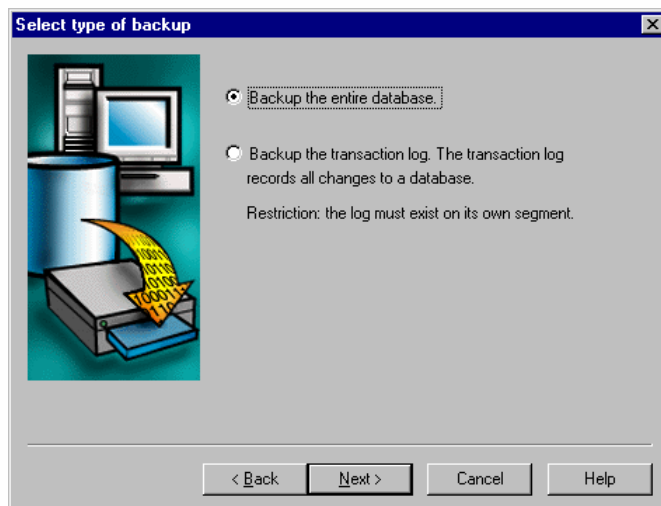
Note: If you do not have access to Sybase Central you may follow the steps under Section 2.2 Using WISQL or SQL Advantage.

After a Dump Device has been created, this device can be used to store backup data.

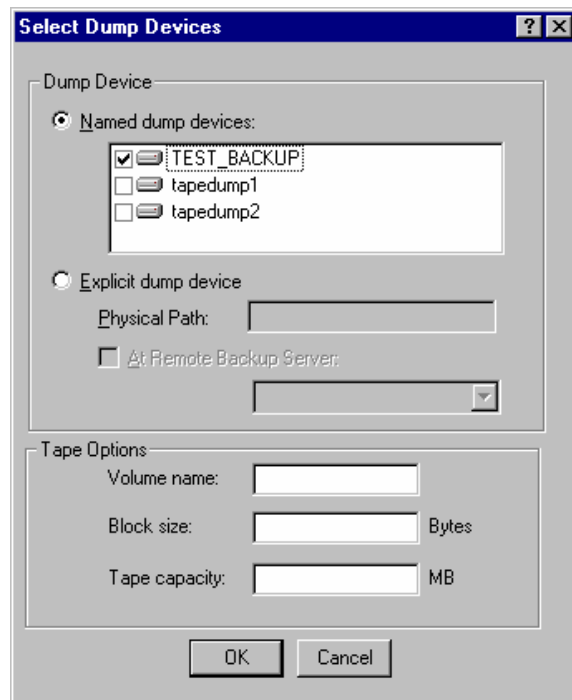
Log into Sybase Central as the 'sa' and go to the folder named Databases. Highlight the database that you want to backup then right click on this database and select Backup. Or highlight the database that you want to backup then go to the File menu and select Backup. This launches the backup wizard. If the database name is correct select the Next button.



Select "Backup the entire database." Click the Next button.



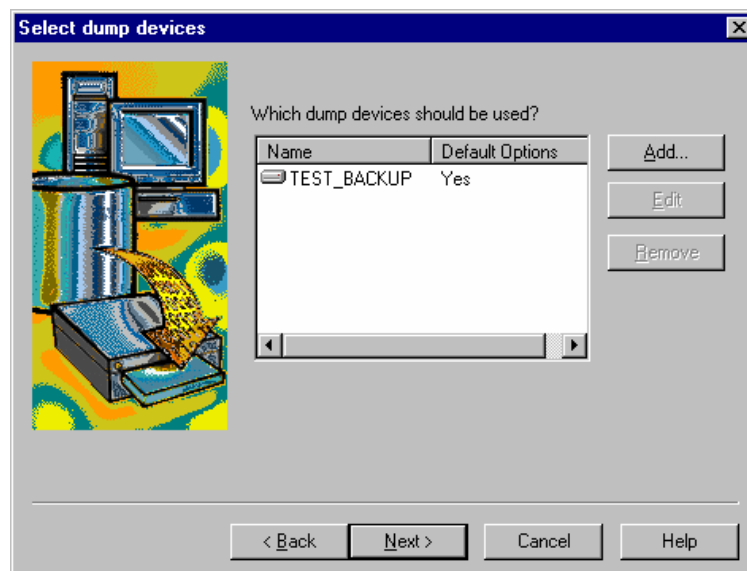
The next screen (not shown) prompts you to select Dump Devices. Click on the Add button. The select Dump Devices window appears.



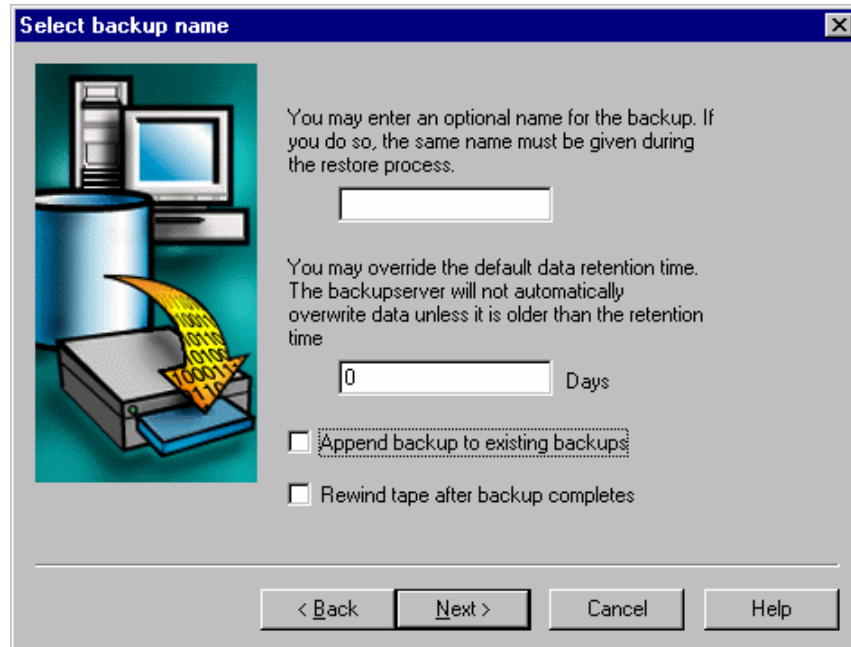
Select the Dump Device that you want to use.

Note: You can also backup your database using more than one device. This will prevent potential problems from happening if the backup device fills up. See Section 3 Backing up the Database to Multiple Devices.

Click OK and you will be returned to the select Dump Devices window. If the name of the dump device is correct click on the Next button.

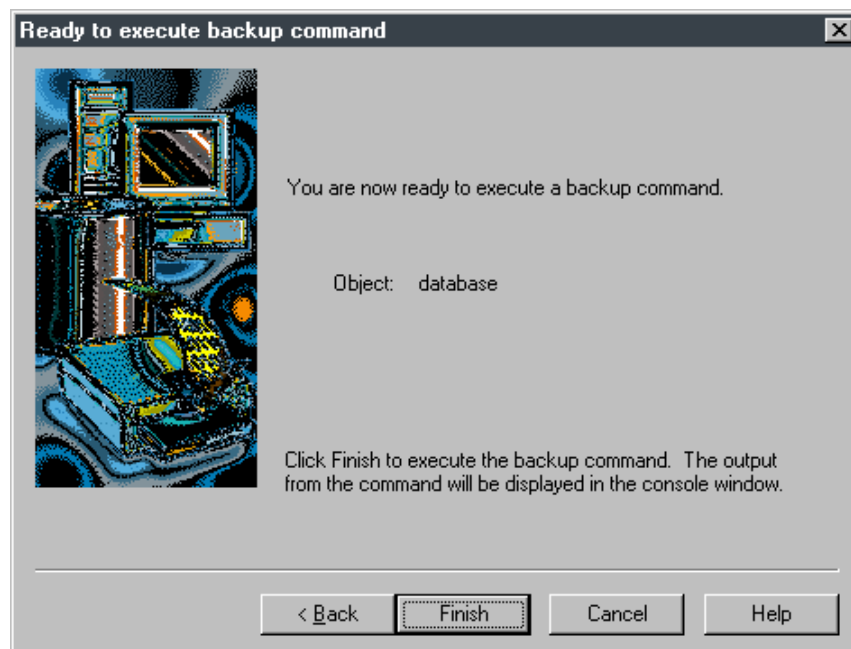


The next window prompts you for a backup name. Leave this field blank. Set the default retention time to 0 Days. This allows the system to overwrite the previous backup at any given time. Make sure the box next to 'Append backup...' is not checked. You may chose to check 'Rewind Tape..' if you are using a Tape Dump Device. Click on the Next button.



The 'Select backup name' dialog box features a blue title bar with a close button. On the left is an illustration of a computer monitor, tower, and a tape drive with a yellow tape labeled '100001110'. The main area contains two paragraphs of text: 'You may enter an optional name for the backup. If you do so, the same name must be given during the restore process.' followed by a text input field, and 'You may override the default data retention time. The backupserver will not automatically overwrite data unless it is older than the retention time' followed by a text input field containing '0' and the label 'Days'. Below these are two unchecked checkboxes: 'Append backup to existing backups' and 'Rewind tape after backup completes'. At the bottom are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

Select Finish on the final window.



The 'Ready to execute backup command' dialog box has a dark grey title bar with a close button. On the left is an illustration of a computer monitor, tower, and a tape drive. The main area contains the text 'You are now ready to execute a backup command.' followed by 'Object: database'. Below this is the instruction 'Click Finish to execute the backup command. The output from the command will be displayed in the console window.' At the bottom are four buttons: '< Back', 'Finish', 'Cancel', and 'Help'.

When the backup starts a Sybase Tools Console window appears and begins to list the progress of the backup.

```

Backup Server session id is: 5. Use this value when executing the 'sp_volchanged'.
Backup Server: 4.41.1.1: Creating new disk file c:\sybase\backup\TEST_DUMP.dmp.
Backup Server: 6.28.1.1: Dumpfile name '0001_DB9929309AD8' section number 0001 mou

Backup Server: 4.58.1.1: Database SPS_M00001_DB: 40650 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 60212 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 61846 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 66762 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 78964 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 82080 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 93642 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 117702 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 119112 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 124192 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 128564 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 177030 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 256360 kilobytes DUMPed.

```

When the backup is complete a line stating “DUMP is complete” should appear at the bottom of the Sybase Tools Console window. You may close this window when the backup is complete.

```

Backup Server: 4.58.1.1: Database SPS_M00001_DB: 256360 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 307820 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 358208 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 384230 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 388422 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 390600 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 409602 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 457296 kilobytes DUMPed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 496722 kilobytes DUMPed.
Backup Server: 3.43.1.1: Dump phase number 1 completed.
Backup Server: 3.43.1.1: Dump phase number 2 completed.
Backup Server: 3.43.1.1: Dump phase number 3 completed.
Backup Server: 4.58.1.1: Database SPS_M00001_DB: 496730 kilobytes DUMPed.
Backup Server: 3.42.1.1: DUMP is complete (database SPS_M00001_DB).

Setting database to ONLINE...
Finished

```

Note: Section 5: Verifying Database Backups describes methods that can be used to confirm that the backup was successful.

2.2 Using WISQL or SQL Advantage

Note: If you do not have access to WISQL or SQL Advantage you may follow the steps under Section 2.1 Using Sybase Central.

Execute the following command in WISQL or SQL Advantage if you have a Dump Device.

```
dump database <database_name> to <device_name>
```

<database_name> = the name of the database that you are backing up.

<device_name> = the name of your dump device.

Example

```
dump database SPS_TEST to TEST_BACKUP
go
```

Execute the following command in WISQL or SQL Advantage if you want to use a physical file for your backup.

```
dump database <database_name> to "<physical_file>"
```

<database_name> = the name of the database that you are backing up.

<physical_file> = the directory and file name of the .dmp file.

Example

```
dump database SPS_TEST to
"c:\sybase\backup\TEST_BACKUP.dmp"
go
```

Note: If the physical file exists, the previous backup will be over written. If the physical file does not exist then one will be created.

Note: You can also backup your database using more than one device. This will prevent potential problems from happening if the backup device fills up. See Section 3 Backing up the Database to Multiple Devices.

When the backup is complete a line stating "DUMP is complete" should appear at the bottom of the WISQL/SQL Advantage window.

Note: Section 5: Verifying Database Backups describes methods that can be used to confirm that the backup was successful.

3. Backing up the Database to Multiple Devices

On some Unix systems the dump device may eventually fill up. This occurs when the actual space used in your database exceeds 2.0GB. When this happens, the backup log on the server will have the following error messages:

```
Feb 23 14:27:30 2000: Backup Server: 4.82.2.22:  
Operating system error, server device  
c:\sybase\backup\TEST_BACKUP.dmp: code 5  
message I/O error.  
  
Feb 23 14:27:31 2000: Backup Server: 4.82.2.37:  
Operating system error, server device  
c:\sybase\backup\TEST_BACKUP.dmp: code 27  
message File too large.
```

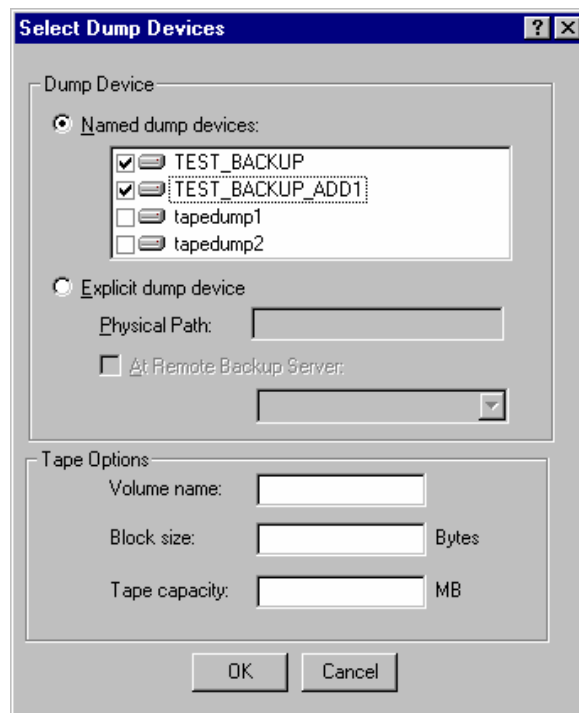
When this happens you need to extend your backup onto a second device. This method of extending a backup onto multiple devices is known as *striping*.

Note: This message may also appear if the disk where your backups are located runs out of space. In this case you need to increase the amount of available space on the disk or create a new dump device on a network drive that has more space. See Section 4: Backing Up Your Database to a Network Drive for more details.

3.1 Using Sybase Central

Note: If you do not have access to Sybase Central you may follow the steps under Section 3.2 Using WISQL or SQL Advantage.

Follow the procedure in Part I: Creating a Dump Device to create a second dump device using the same name as the first one but include an extension such as “_ADD1” to indicate that this is the first addition to the current dump device. Once the device has been created follow the instructions in Part II: Backing Up the Database. When you get to the screen prompting you to select a dump device select both the original dump device and the addition that you just created.



Note: If your backup exceeds the space available on two devices, you may create and select additional dump devices when backing up your database.

3.2 Using WISQL or SQL Advantage

Note: If you do not have access to WISQL or SQL Advantage you may follow the steps under Section 3.1 Using Sybase Central.

Follow the procedure in Part I: Creating a Dump Device to create a second dump device using the same name as the first one but include an extension such as “_ADD1” to indicate that this is the first addition to the current dump device. Once the device has been created follow the instructions below to extend your backup onto a second device.

Execute the following command in WISQL or SQL Advantage if you use *dump devices* for your backup.

```
dump database <database_name> to <device_name> stripe
on <device_name_ADD1>
```

<database_name> = the name of the database that you are backing up.

<device_name> = the name of your dump device.

<device_name_ADD1> = the name of your additional dump device.

Example

```
dump database SPS_TEST to TEST_BACKUP stripe on
TEST_BACKUP_ADD1
go
```

Execute the following command in WISQL or SQL Advantage if you use *physical files* for your backup.

```
dump database <database_name> to "<physical_file>"
stripe on "<physical_file_ADD1>"
```

<database_name> = the name of the database that you are backing up.

<physical_file> = the directory and file name of the .dmp file.

<physical_file_ADD1> = the directory and file name of the additional .dmp file.

Example

```
dump database SPS_TEST to
"c:\sybase\backup\TEST_BACKUP.dmp" stripe on
"c:\sybase\backup\TEST_BACKUP_ADD1.dmp"
go
```

Note: If your backup exceeds the space available on two devices, you may use the “stripe on” command to add additional dump devices to your dump database command.

4. Backing Up Your Database to a Network Drive

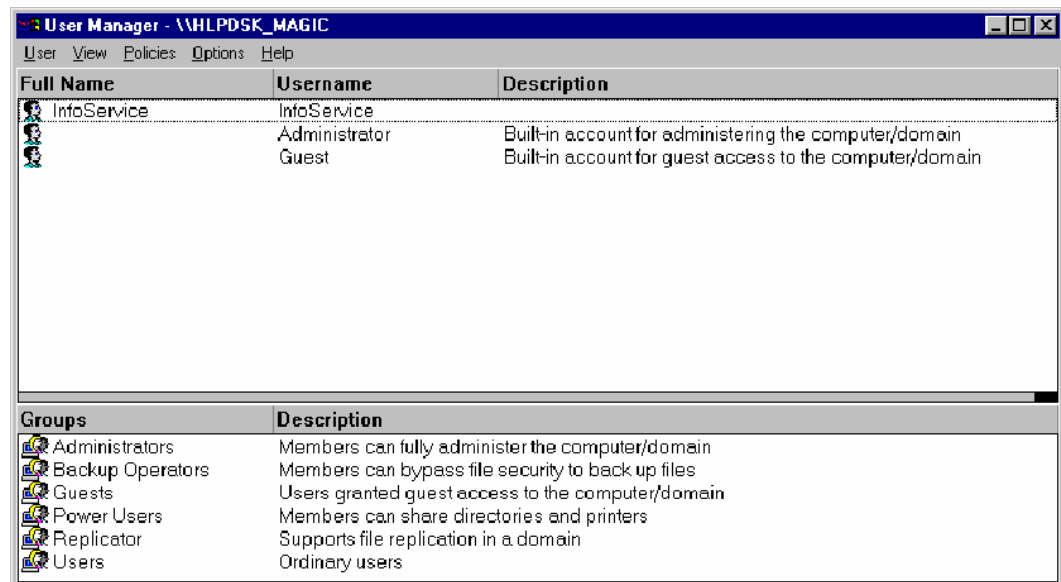
There may be times when backups need to be written to a remote network drive. In order to do this the Sybase Backup Server needs to access the remote network drive using an authorized NT logon account. There are 3 steps that need to be done to establish this access.

- Create a Sybase logon account on the Sybase Server and the PC that houses the remote drive
- Start the backup server using this Sybase account
- Map the network drive to the Sybase Server

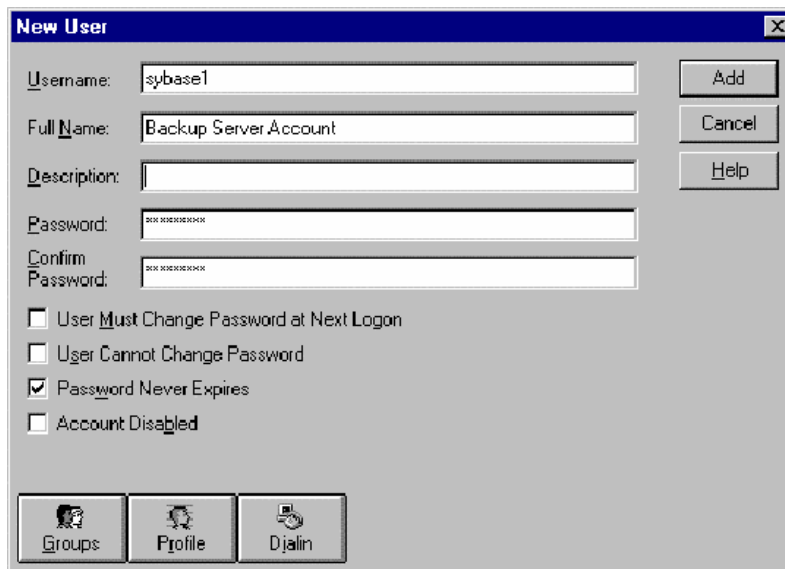
4.1 Create a Sybase Account for the Backup Server

4.1.1 Create Sybase Account

From the Start menu on the Sybase server go to Programs → Administrative Tools (Common) → User Manager for Domains. This will launch the User Manager for the NT Server.



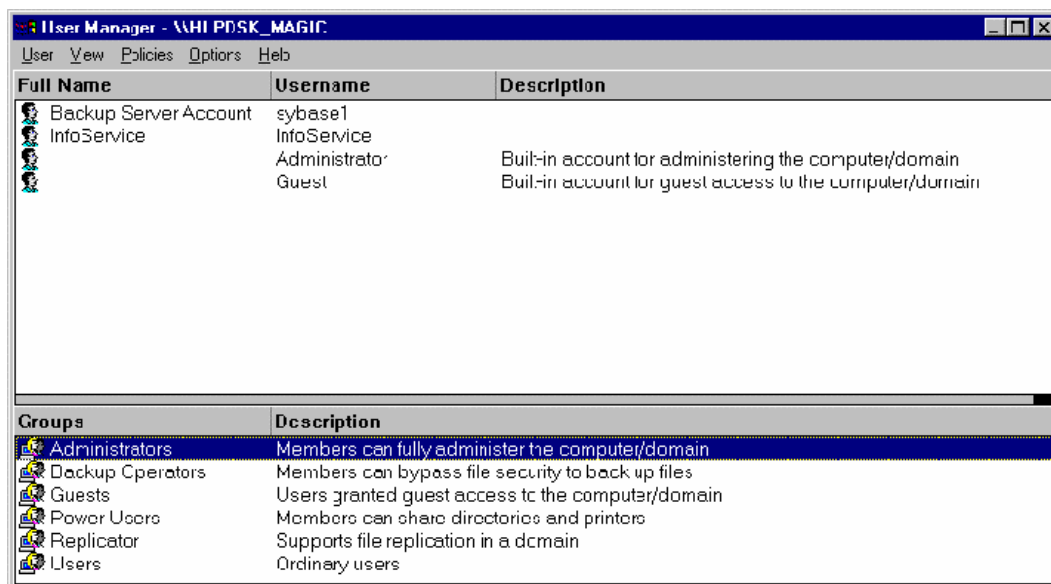
From the file menu select User → New Users. This launches the New User window.



The 'New User' dialog box contains the following fields and options:

- Username:** sybase1
- Full Name:** Backup Server Account
- Description:** (empty)
- Password:** (masked with asterisks)
- Confirm Password:** (masked with asterisks)
- ☐ User Must Change Password at Next Logon
- ☐ User Cannot Change Password
- ☒ Password Never Expires
- ☐ Account Disabled
- Buttons:** Add, Cancel, Help
- Footer Buttons:** Groups, Profile, Dialin

Create an account for the backup server by entering a user name, description and password. When finished click the add button. The new user will appear in the User Manager window.



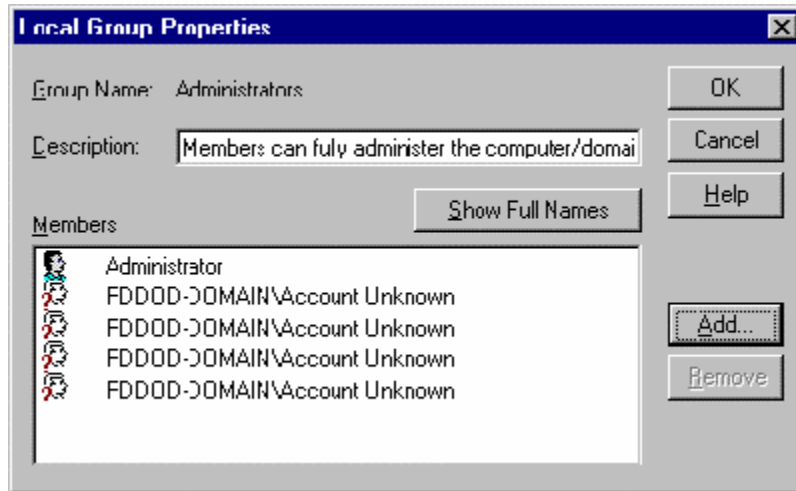
The 'User Manager' window displays a list of users and a list of groups.

Full Name	Username	Description
Backup Server Account	sybase1	
InfoService	InfoService	
Administrator	Administrator	Built-in account for administering the computer/domain
Guest	Guest	Built-in account for guest access to the computer/domain

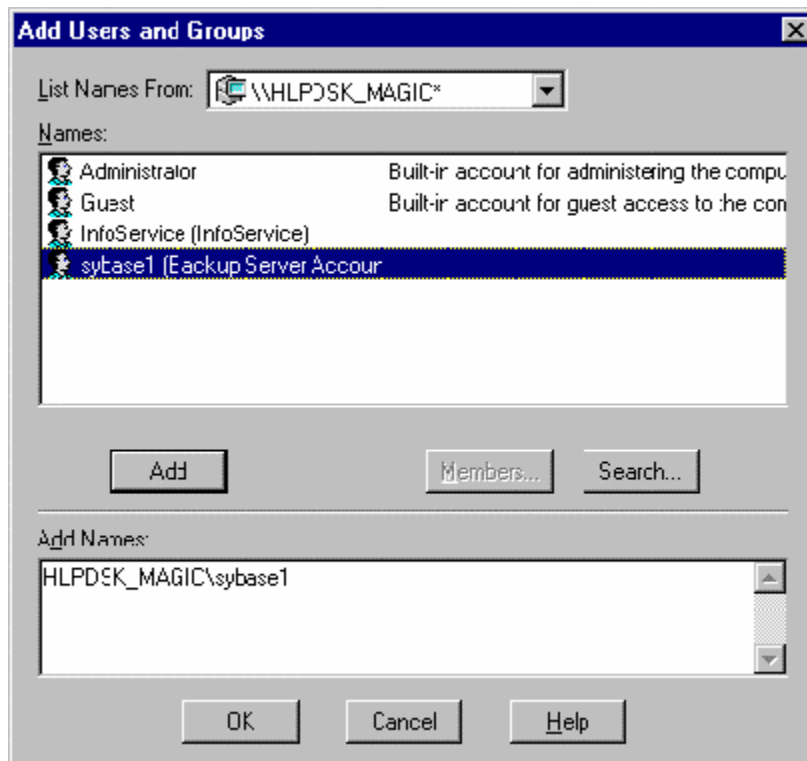
Groups	Description
Administrators	Members can fully administer the computer/domain
Backup Operators	Members can bypass file security to back up files
Guests	Users granted guest access to the computer/domain
Power Users	Members can share directories and printers
Replicator	Supports file replication in a domain
Users	Ordinary users

4.1.2 Assign Administrative Rights to the Sybase Account

From the lower half of the User Manager window double click on the Administrators group. This will launch the Local Group properties window for the Administrator group.

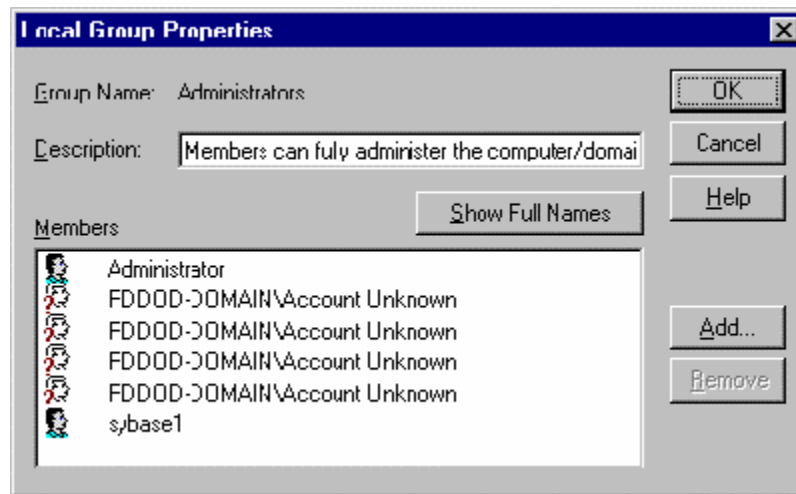


Click on the Add button. This launches the Add Users and Groups window.



Highlight the Sybase Account and click on the Add button. This will place the account in the lower half of the window. Then click on the OK button.

The Sybase account now has administrative access to the Sybase server.

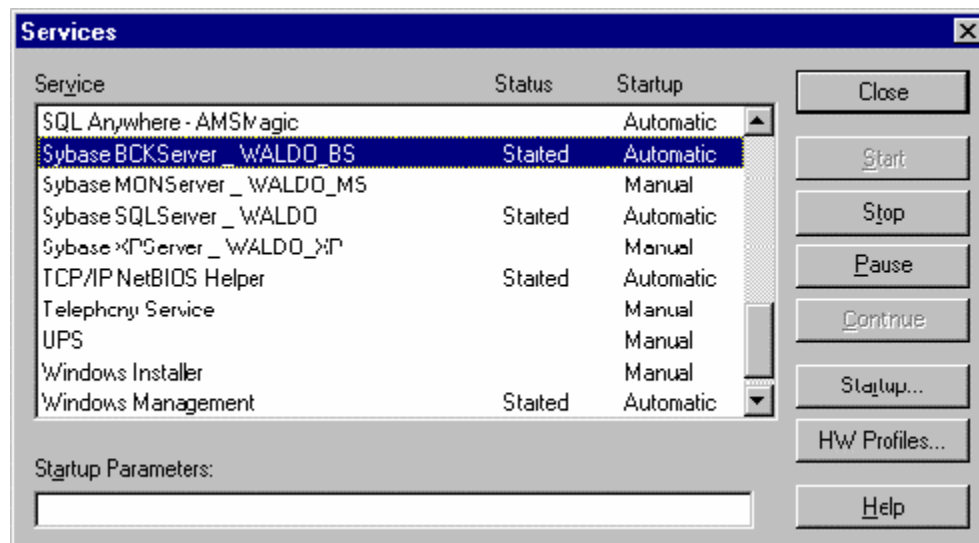


Note: Before proceeding to the next section you must repeat the steps in Section 4.1.1 and 4.1.2 to create the **exact same account id and password** on the PC where the backups are going to be stored.

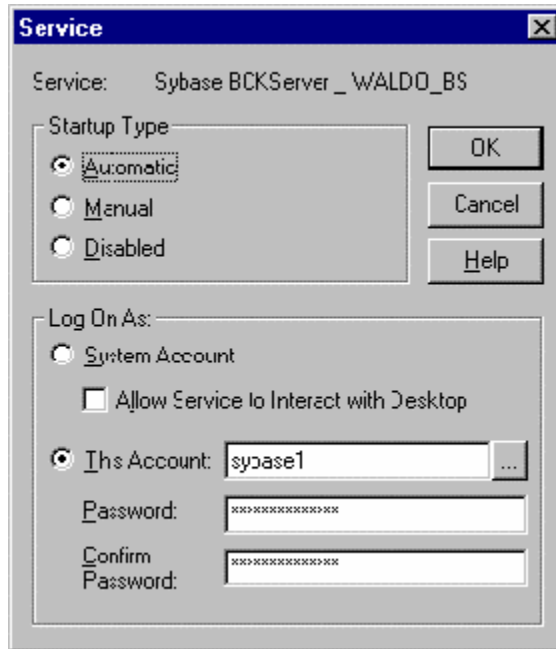
4.2 Start the Backup Server using the Sybase Account



Open the Control Panel and click on the Services icon [Services](#). Locate the Sybase Backup Server from the list of services.



Highlight the entry and select the Start button.



When the Service window opens select the radio button next to This Account in the Log On As section. Enter the account name and password that was created in Section 4.1.1. Also make sure the Startup Type is set to Automatic. Click on OK to close this window.

From the Services window highlight the backup server and click on the Stop button. Once the backup server has stopped click on the Start button to restart it using the Sybase account.

4.3 Map the Network Drive to the Sybase Server

Once the backup server has been started using an account that also exists on the remote PC, a mapped drive must be created on the Sybase Server that points to the directory where the backups will be placed. Consult the network administrator at your site for details on how to perform this task.

4.4 Perform a Database Backup

Follow the steps in Section 1 of this paper to create the database devices on the remote drive that is now mapped to your server. Then follow the steps in Section 2 to complete the backup.

Note: When backing up to a network drive it is important to verify that the backup was successful. Use the methods described in the following section to confirm that your backups are complete.

5. Verifying Database Backups

The previous sections of this document describe several ways to backup up your PD² database. This section discusses ways to determine if your backup was successful.

There are several reasons why a backup may fail to successfully complete. Below is a list of some of the common problems that cause backups to fail.

- The hard drive where the dump devices are located has run out of space
- The dump device has exceeded its 2.0GB limit (Unix Only)
- The Sybase account password that is used to connect to the remote server has changed (NT Only)

Regardless of what causes the backup to fail, it is important to identify a failed backup before it is too late.

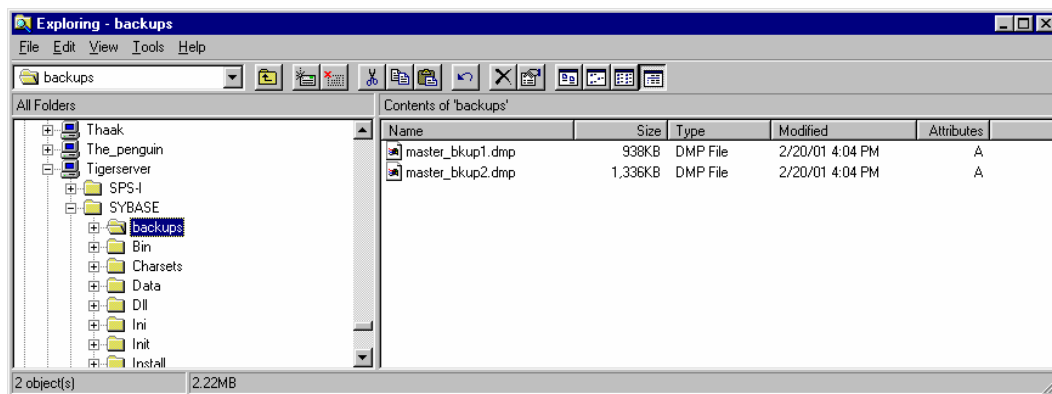
The following sections list methods that can be used to verify that a backup is successful. These checks can be used separately. But to be absolutely certain that a backup is successful AMS recommends using all four of these methods to verify your backup. These methods are as follows:

1. Check the date/time stamp of the dump files
2. Check the backup log for errors
3. Use the *load database ... with headeronly* command
4. Load the backup to a test database

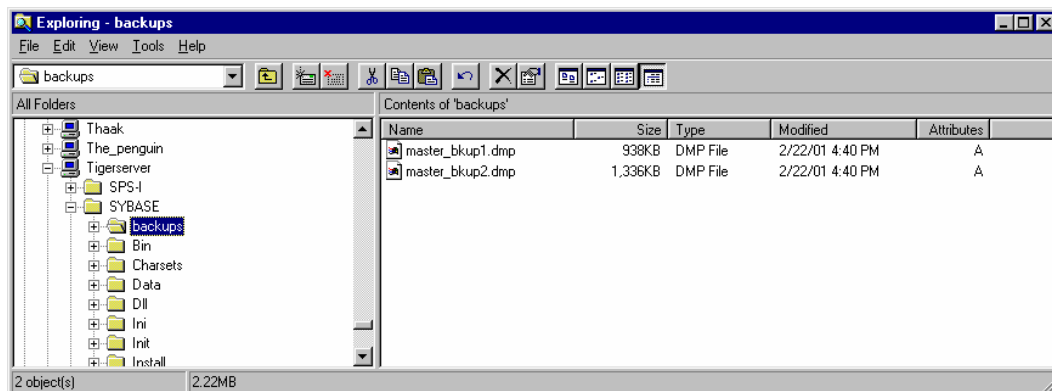
Note: This paper only covers verifying disk dump files. It **does not** discuss verifying tape or file system backups. This is because AMS recommends that sites backup each of their databases to a disk dump file **first** before copying the dump file to an external tape or disk drive.

5.1 Check the Date/Time Stamp of the Dump Files

One of the easiest ways to verify that the backup is successful is to check the date/time stamp of the dump file. Locate the dump files on your server and note the current date and time.



Once you have located the dump files, perform a backup. If the backup is successful the date and time stamp of the dump file will indicate the time the backup was performed.



5.2 Check the Backup Log for Errors

In addition to checking the data/time stamp of the dump files, you should also check the backup log to see if the backup is complete for the date on the dump file. The backup log (filename: backup.log) is usually located on the Sybase Server in the c:\sybase\install directory for NT servers or in the \$SYBASE/install directory on Unix servers. Any time the system performs a backup or restore the information is captured in the backup log. The initiation, progress and completion of the backup and restore commands can be viewed in the backup log.

When a backup is successful a message appears in the log indicating that the dump is complete (See Figure Below).

```
Feb 22 16:40:16 2001: Backup Server: 6.28.1.1: Dumpfile name
'master010530EA6F ' section number 0001 mounted on disk file
'c:\sybase\backups\master_bkup1.dmp'
Feb 22 16:40:17 2001: Backup Server: 6.28.1.1: Dumpfile name
'master010530EA6F ' section number 0001 mounted on disk file
'c:\sybase\backups\master_bkup2.dmp'
Feb 22 16:40:20 2001: Backup Server: 4.58.1.1: Database master: 2030
kilobytes DUMPed.
Feb 22 16:40:20 2001: Backup Server: 4.58.1.1: Database master: 2242
kilobytes DUMPed.
Feb 22 16:40:23 2001: Backup Server: 3.43.1.1: Dump phase number 1 completed.
Feb 22 16:40:23 2001: Backup Server: 3.43.1.1: Dump phase number 2 completed.
Feb 22 16:40:23 2001: Backup Server: 3.43.1.1: Dump phase number 3 completed.
Feb 22 16:40:23 2001: Backup Server: 4.58.1.1: Database master: 2254
kilobytes DUMPed.
Feb 22 16:40:23 2001: Backup Server: 3.42.1.1: DUMP is complete (database
master).
```

If this message does not appear for every database that was backed up, then the backup was not successful. The backup log usually prints an error message when a backup fails to complete. Most error messages contain a number and a brief description of the problem. You may call the Help Desk to get a detailed explanation of the error or you can look it up in the technical reference manual section of Sybase's website <http://sybooks.sybase.com/srg1100e.html>. Search the "Troubleshooting and Error Message Guide" for the error number or phrase that appears in the backup log.

5.3 Use the *load database ... with headeronly* command

Even if the dump file is up to date *and* the backup log shows that a backup is complete, you can still encounter problems when attempting to load the database from backup. One way to test the successfulness of loading a database without actually loading it is to run the load database command with the *headeronly* option.

The *load database... with headeronly* command allows a user to see what messages will appear prior to restoring a database without actually restoring it. The dump header indicates whether the file contains a database or transaction log dump, the database ID, the file name, the date the dump was made, the character set, sort order, page count, and next object ID. If errors appear in the dump header then there may be problems with dump file or the load command itself. The messages that appear as a result of executing this command inform the user as to whether the restore command will be successful or unsuccessful. It does not necessarily indicate that the backup was unsuccessful.

Connect to the server as 'sa' using SQL Advantage. Execute the following SQL command.

```
load database <db_name> from <device_name>
with headeronly
go
```

<db_name> = the name of the database that will be restored.

<device_name> = name of the dump device that will be used to restore the database.

Example

```
load database master from master_backup
with headeronly
go
```

The output will look similar to the following. The messages that are highlighted in the following output indicate the type of information that is received when the *load database...with headeronly* command is executed without errors.

```
Server Message: Number 3216, Severity 10
Line 1:
Backup Server session id is: 21. Use this value when executing the
'sp_volchanged' system stored procedure after fulfilling any volume change
request from the Backup Server.
Server Message: Number 602801, Severity 1
Server 'TIGERSERVER_BS', Procedure 'bs_read_header', Line 0:
Backup Server: 6.28.1.1: Dumpfile name 'master010530EA6F' section number 0001
mounted on disk file 'c:\sybase\backups\master_bkup1.dmp'
Server Message: Number 602801, Severity 1
Server 'TIGERSERVER_BS', Procedure 'bs_read_header', Line 0:
Backup Server: 6.28.1.1: Dumpfile name 'master010530EA6F' section number 0001
mounted on disk file 'c:\sybase\backups\master_bkup2.dmp'
Server Message: Number 3124, Severity 10
Line 1:
This is a database dump of database ID 1, name 'master', from Feb 22 2001
4:40PM. SQL Server version: SQL Server/11.0.3.3/P/PC Intel/Windows NT 3.5/SWR
7926 Rollup/OPT/Mon Jun 1 1998 23:06:50.62. Backup Server version: Backup
Server/11.0.3.3/P/PC Intel/Windows NT 3.5/SWR 7926 Rollup/OPT/ Mon Jun 1 1998
23:48:29.18 .
Server Message: Number 3125, Severity 10
Line 1:
Database contains 2560 pages; checkpoint RID=(Rid pageid = 0x69c; row num =
0x4); next object ID=1520008446; sort order ID=50, status=0; charset ID=3.
Server Message: Number 3136, Severity 10
Line 1:
Database log version=2; database upgrade version=1.
```

The messages highlighted in the following output indicate the errors that appear if the database was backed up using multiple devices (i.e. striped) and the load command does not list all of the striped devices.

```
Server Message: Number 3216, Severity 10
Line 1:
Backup Server session id is: 19. Use this value when executing the
'sp_volchanged' system stored procedure after fulfilling any volume change
request from the Backup Server.
Server Message: Number 602801, Severity 1
Server 'TIGERSERVER_BS', Procedure 'bs_read_header', Line 0:
Backup Server: 6.28.1.1: Dumpfile name 'master010530EA6F ' section number 0001
mounted on disk file 'c:\sybase\backups\master_bkup1.dmp'
Server Message: Number 405402, Severity 2
Server 'TIGERSERVER_BS', Procedure 'bs read header', Line 0:
Backup Server: 4.54.2.1: The load command specifies too few devices of type
'disk file': expected 2, got 1.
Server Message: Number 603202, Severity 2
Server 'TIGERSERVER_BS', Procedure 'bs read header', Line 0:
Backup Server: 6.32.2.3: c:\sybase\backups\master_bkup1.dmp: volume not valid
or not requested (server: , session id: 19.)
Server Message: Number 101402, Severity 2
Server 'TIGERSERVER_BS', Procedure 'bs_read_header', Line 0:
Backup Server: 1.14.2.4: Unrecoverable I/O or volume error. This DUMP or LOAD
session must exit.
Server Message: Number 8009, Severity 16
Line 1:
Error encountered by Backup Server. Please refer to Backup Server messages for
details.
```

5.4 Load the Database to a Test Database

The previous sections discussed methods that can be used to verify that your database has been successfully backed up and can be successfully restored. However the only way to be absolutely certain that the database backup was successful is to restore it into a test database and log into it using PD² to check that the information is complete and up to date. Detailed instructions on how to create a test database can be found in the paper entitled “How to Create a PD² Database”.